

Attorney Docket No.: **NE-0002**
Inventors: **Borgstahl et al.**
Serial No.: **10/681,874**
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REMARKS

Claims 1-9 are pending in the instant application. Claims 1-9 have been rejected. Claim 9 has been amended. No new matter has been added by this amendment. Reconsideration is respectfully requested in light of the following remarks.

I. Objections to the Specification

The Abstract of the Disclosure has been objected to. Accordingly, Applicants have amended the Abstract to provide a concise statement of the technical disclosure of the patent.

The specification at page 9, line 34, has been objected to for referring to Figure 2 of which there is none. Applicants have amended the specification at page 9, line 34, to refer to Figure 1.

In light of these amendments, reconsideration and withdrawal of these objections is respectfully requested.

II. Objections to the Drawings

Figure 1 has been objected to under 37 CFR 1.83(a) for failing to show the "x-ray emitting source" and "sample holder" of claim 1. As taught at page 8, lines 25-27, the sample holder is positioned between the x-ray emitting source and the CCD camera. In accordance with these teachings, Applicants have amended the paragraph beginning at page 9, line 34, to make reference to the sample holder **10** and x-ray emitting source **11** depicted in corrected Figure 1 submitted herewith in compliance with 37 CFR 1.121(d). Withdrawal of the objection to Figure 1 is therefore respectfully requested.

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III. Rejection Under 35 U.S.C. §112

Claims 4-9 have been rejected under 35 U.S.C. 112, second paragraph, because the method claims 4-9 improperly depend on the apparatus of claim 1. Applicants respectfully traverse this rejection.

MPEP 2173.05(f) states that a claim which makes reference to a preceding claim to define a limitation is an acceptable claim construction which should not necessarily be rejected as improper or confusing under 35 U.S.C. 112, second paragraph. For example, "A method of producing ethanol comprising contacting amylose with the culture of claim 1 under the following conditions" is not indefinite under 35 U.S.C. 112 , second paragraph, merely because of the reference to another claim.

Claim 4, and claims 5-9 dependent thereon, reads on a method for digital topography imaging by placing a sample in the sample holder of the system of claim 1 (b). Analogous to the method and cell culture example of MPEP 2173.05(f), the instant method of claims 4-9 relies of the use of the digital topography imaging system of claim 1. Accordingly, rejection of claims 4-9 under 35 U.S.C. 112, second paragraph is improper. Withdrawal of this rejection is therefore respectfully requested.

IV. Rejection Under 35 U.S.C. §103

Claims 1, 2, and 4-9 have been rejected under 35 U.S.C. 103(a) as being unpatentable over Bowen et al. (U.S. Patent No. 6,782,076) and further in view of Amelio (U.S. Patent No. 3,866,067) and Atac et al. (U.S. Patent No. 5,978,444). Regarding claims 1, 4, and 9, it is suggested that Bowen et al. disclose a digital topography imaging system comprising an x-ray emitting

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source (12); a sample holder (42); a charge coupled device (CCD) camera (column 4, lines 16-17); and a means for acquiring and displaying images of a sample; wherein x-rays from the x-ray emitting source pass through a sample, and are converted by the CCD camera into electrical signals so that the resulting x-ray reflection profiles are measured and the structure of the sample is acquired and displayed (column 4, lines 35-52).

The Examiner acknowledges that Bowen et al. do not disclose the CCD camera with antiblooming circuitry which reduces pixel image corruption due to CCD camera pixel overloading; however, it would have been obvious to one of skill in the art to use the antiblooming circuitry for a CCD as disclosed by Amelio (column 1, lines 5+).

The Examiner further acknowledges that while Bowen et al. are silent to whether the CCD camera converts x-ray signals to electrical signals without the use of phosphor, Atac et al. disclose a direct conversion CCD (column 2, lines 2+). It is suggested that it would have been obvious to one of skill to use the direct conversion CCD of Atac et al. in the apparatus of Bowen et al. to allow for better image resolution and to allow detection of x-rays directly and on a real-time basis.

The Examiner suggests that while the phrase "may be employed" is not a positive recitation and no method steps to perform determination of the crystalline structure are recited in claim 9, Bowen et al. disclose determining the crystalline structure of a sample (column 1, lines 1-5).

Regarding claim 2, it is suggested that Bowen et al. teach a CCD camera having a pixel size of less than 10 μm (column 4, line 19).

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Regarding claims 5-8, it is suggested that while Bowen et al. do not disclose the specific method steps claimed, it would have been obvious to one of ordinary skill in the art to those known processing techniques to provide clear images in the Bowen et al. apparatus, to enhance image resolution.

Claim 3 has also been rejected under 35 U.S.C. 103(a) as being unpatentable over Bowen et al. (U.S. Patent No. 6,782,076) and further in view of Amelio (U.S. Patent No. 3,866,067) and Atac et al. (U.S. Patent No. 5,978,444) as applied to claim 1, and further in view of Chapman et al. (U.S. Patent No. 5,987,095). It is suggested that while Bowen et al. do not teach an x-ray source with a shutter, allowing for variable exposure times, that Chapman et al. disclose an x-ray source with a shutter (14).

Applicants respectfully traverse these rejections.

At the outset, Applicants have amended claim 9 to remove reference to the phrase "may be employed" and clarify the method step of determining the crystalline structure of a sample.

To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and

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not based on Applicants' disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991). MPEP 2142.

Bowen et al. teach a digital topography imaging system comprising an x-ray emitting source, a sample holder, a CCD camera, and a means for acquiring and displaying images of a sample. However, Bowen et al. neither teach nor suggest employing antiblooming circuitry to reduce pixel image corruption due to CCD camera pixel overloading. Applicants respectfully disagree with the Examiner's suggestion it would be obvious to one of skill in the art that the deficiencies in the teachings of Bowen et al. can be overcome by the teachings of Amelio. Amelio teaches CCD devices with light sensing elements comprising antiblooming circuitry. The light sensing elements of Amelio accumulate charge in response to incident radiation such as light (see column 1, lines 57-60). There is no teaching or suggestion that the light sensing elements of the CCD devices of Amelio can be adapted for use in sensing invisible, diffracted x-ray energies. Likewise, Atac et al. and Chapman et al. fail to teach or suggest CCD devices with antiblooming circuitry for use in sensing invisible, diffracted x-ray energies. Accordingly, there is no teaching or suggestion in the prior art to make the claimed invention as required by MPEP 2142. Only hindsight would motivate the skilled practitioner to combine the cited references and arrive at the invention set forth in claim 1, and claims 2-9 dependent therefrom. It is therefore respectfully requested that the rejection of claims 1-9 under 35 U.S.C. 103(a) be reconsidered and withdrawn.

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V. Conclusion

The Applicants believe that the foregoing comprises a full and complete response to the Office Action of record. Accordingly, favorable reconsideration and subsequent allowance of the pending claims is earnestly solicited.

Respectfully submitted,



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